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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/735,912	12/16/2003	Seung-Chul Choi	040021-0306769	3859
909 7590 03/28/2007 PILLSBURY WINTHROP SHAW PITTMAN, LLP P.O. BOX 10500 MCLEAN, VA 22102			EXAMINER LUND, JEFFRIE ROBERT	
			ART UNIT	PAPER NUMBER
			1763	
SHORTENED STATUTORY PERIOD OF RESPONSE		MAIL DATE	DELIVERY MODE	
3 MONTHS		03/28/2007	PAPER	

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

## Office Action Summary

Application No.

10/735,912

Applicant(s)

CHOI, SEUNG-CHUL

Examiner

Jeffrie R. Lund

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 02 February 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1,2,4 and 6-13 is/are pending in the application.
- 4a) Of the above claim(s) 9-13 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,2,4 and 6-8 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 December 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
  - 2) ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date: \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Double Patenting***

1. Applicant is advised that should claim 1 be found allowable, claim 4 will be objected to under 37 CFR 1.75 as being a substantial duplicate thereof. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

### ***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1, 2, 4, and 6-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Basceri et al, US Patent Application Publication 2002/0132374 A1, in view of Mitani et al, JP 3-281780.

Basceri et al teaches a deposition apparatus that includes: a process chamber 50; a gas supply assembly 72 in a first end of the process chamber; a chuck 66 configured to support a wafer 10; a vacuum pump 70 connected to exhaust port located in a second end of the processing chamber, opposite the gas supply assembly; a position control assembly (represented by arrows 85) for raising and lowering the chuck; and a controller (not shown see paragraph 0054 to control the position control assembly

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such that the distance between the wafer and the gas assembly is varied during the deposition process. (Figure 3) Basceri et al also teaches that the chuck can be raised and lowered during the deposition process to control the stoichiometry of the deposited layer. In paragraph 0038 Basceri et al teaches continually increasing the concentration of Ti in the layer from the lower edge 13 to the top edge 15. In paragraph 0053 Basceri et al teaches that when D (the distance between the chuck and the gas supply assembly) is decreased the amount of Ti in the layer decreases. Therefore, in order to continually increase the Ti concentration, the distance between the chuck and gas supply assembly must be continually increased.

Basceri et al differs from the present invention in that Basceri does not teach that the gas supply assembly is divided into a center and outer portions each connected to a process gas line; a valve in the process gas line attached to the outer portion; and controlling the valve.

Mitani et al teaches a processing apparatus that includes a gas supply assembly divided into a center section 21 and an outer section 22, 23, and the center and outer sections are connected to a process gas line with a valve 54 which is controlled by a controller 510. (Entire document, specifically, figures 2 and 5)

The motivation for dividing the gas supply assembly of Basceri et al and providing valves to control the gas flow into each section is to more accurately control the flow of gas into the processing chamber through out the deposition process, which results in a more uniform deposited layer as taught by Mitani et al.

Therefore it would have been obvious to one of ordinary skill in the art at the time.

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the invention was made to divide the gas supply assembly of Basceri et al and to control the gas flow through the sections with a valve controlled by a controller as taught by Mitani et al.

4. Claims 1, 2, 4, and 6-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ingle et al, US Patent 6,905,940 B2, in view of Mitani et al, JP 3-281780.

Ingle et al teaches a CVD apparatus that includes: a process chamber 15; a gas supply assembly 20; a chuck 25 configured to support a wafer; a vacuum pump 88; a position control assembly for raising and lowering the chuck; and a controller 53 to control the position control assembly 160 such that the distance between the wafer and the gas assembly is varied during the deposition process. (Entire document, specifically figure 1A, 1D, 5; and column 12 lines 48-64) Ingle et al also teaches that changing the distance between the chuck and gas supply assembly, changes the deposition rate.

Ingle et al differs from the present invention in that Ingle does not teach that the vacuum pump is opposite the gas supply assembly; that the gas supply assembly is divided into a center and outer portions each connected to a process gas line; a valve in the process gas line attached to the outer portion; controlling the valve; or increasing the distance between the wafer and the gas supply assembly during the deposition of the layer.

Mitani et al teaches a processing apparatus that includes a gas supply assembly divided into a center section 21 and an outer section 22, 23, the center and outer sections are connected to a process gas line with a valve 54 which is controlled by a

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controller 510; and the vacuum pump 512, 513 is opposite the gas supply assembly.

(Entire document, specifically, figures 2 and 5)

The motivation for dividing the gas supply assembly of Ingle et al and providing valves to control the gas flow into each section is to more accurately control the flow of gas into the processing chamber through out the deposition process, which results in a more uniform deposited layer as taught by Mitani et al.

The motivation for moving the vacuum of Ingle to opposite the gas supply assembly is to provide an alternate and equivalent gas flow as taught by Mitani et al.

The motivation for increasing the distance between the gas supply assembly and the wafer is to decrease the deposition rate as taught by Ingle et al.

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to divide the gas supply assembly, control the gas flow using a valve controlled by the controller, move the vacuum pump, and increase the distance between the gas supply assembly and the wafer.

### ***Response to Arguments***

5. Applicant's arguments regarding Basceri et al and Ingle et al, see pages 6-7 of the "REMARKS", filed January 8, 2007, with respect to the 102 rejection of claims 1, 2, 4, 6, and 7 under Basceri et al or Ingle et al have been fully considered and are persuasive. The 102 rejection of claims 1, 2, 4, and 6-8 has been withdrawn.

6. Applicant's arguments filed January 8, 2007 have been fully considered but they are not persuasive.

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In regard to the argument that Basceri et al does not teach that the controller increases the distance between the gas supply assembly and the wafer during the time required to deposit a layer, the Examiner disagrees. Basceri et al as discussed above, clearly teaches increasing the distance between the gas supply assembly and the wafer during the time required to deposit a layer.

7. Applicant's arguments with respect to the rejection of claims 1, 2, 4, and 6-8, in view of Ingle et al, have been considered but are moot in view of the new ground of rejection.

### ***Conclusion***

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeffrie R. Lund whose telephone number is (571) 272-1437. The examiner can normally be reached on Monday-Thursday (10:00 am - 9:00 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on (571) 272-1435. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should

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you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to read "Jeffrie R. Lund".

Jeffrie R. Lund  
Primary Examiner  
Art Unit 1763

JRL  
3/26/07